

## ***Interactive comment on “A full-mission data set of H<sub>2</sub>O and HDO columns from SCIAMACHY 2.3 μm reflectance measurements” by Andreas Schneider et al.***

**Anonymous Referee #1**

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This study presents the retrievals of columnar water vapor isotopes (H<sub>2</sub>O and HDO) from the SCIAMACHY. Using an algorithm that was developed to retrieve H<sub>2</sub>O/HDO along with CO, authors implement additional spectral range to the algorithm and apply it to the satellite's entire mission period. Ground-based measurements at several sites are used for validating retrieved H<sub>2</sub>O/HDO columnar concentration and depletion. The study also explores the potential benefit by jointly retrieving cloud height and scattering optical depth. They demonstrate that the inclusion of cloud scattering can correct biases in H<sub>2</sub>O/HDO retrievals at an elevated site. This study addresses an important topic. It fall into the scope of AMT journal. Retrieval approach and validation efforts are well designed and well presented. The results are sufficiently discussed. I have only a

C1

few comments, but none of them I believe is major.

Specific comments: P6, L15: Here an area with radius of 800 km surrounded the site is used to sample the satellite data, which is a substantially large area. While it is mentioned in the paper to “include a sufficient amount of measurements”, it may need some additional justifications on how such a big area can well represent the site.

P9, L19: Can the author explain more on how the degradation “especially plays a role for difficult measurement geometries”? And what does the mean by the “difficult measurement geometries”?

P15, L14: “increases somewhat” -> “increases slightly”

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